

DRAGON



USER

September 1986

The independent Dragon magazine

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Letters

Some Poco connections — a left over Lee Isring — new user groups — plans for more Commodore — missing persons.

People's Chart

Find out which is the software master of the month, and what all wins the C64 with of Microgen software.

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FREE! To Dragon User readers, a limited of Dragon 32 reference cards — Dragon internal hardware bargains — new software for the Tandy light pen.

Communication

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Editorial

Rumours get circulating from time to time, like the rumour which said that Dragon User would cease after June (circulated among newsmen), that so-and-so isn't going to produce any more Dragon software (which has often proved to be true, but not as often as it has been put about), that the Dragon is dead (after Dragon Data closed down in 1984) . . . now someone else has started a rumour that our publishers don't like Dragon User, whatever that is supposed to mean.

This concerns us, because it is vague notions like that which cause alarm and disengagement. Now listen here; the publishers brought in new staff to keep Dragon User going, a new computer to help with the administration, and brought off the subscriptions under their own control to avoid problems. While the demand exists, so will Dragon User; the demand comes from users. So don't be disengaged by rumours — none of us want them to become self-fulfilling.

On a much jollier note, a well known electronics company has some Dragon 32 reference cards to give away. See page 4 for details.

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How to submit articles

The quality of the material we can publish in Dragon User each month will, to a very great extent depend on the quality of the documents that you can make with your Dragon. The Dragon computer was launched on to the market with a powerful version of BASIC, but with very poor documentation.

Articles which are submitted to Dragon User for publication should not be more than 3000 words long. All submissions should be typed. Please leave wide margins and a double space between each line. Programs should, wherever possible, be computer printed on plain white paper and be accompanied by a tape or the program itself.

We cannot guarantee to return every submitted article or program, so please keep a copy. If you want to have your program returned you must include a stamped addressed envelope.

Letters

Lost adventure

CAN you help us with the Dragon adventure? We have received an order from Alice for Colossal Caves with a £10 postal order unfortunately, no address was included.

So if you live near Thorne Road post office and haven't received your cassette, please write or phone 061 225 4874 and identify yourself. Your cassette is waiting.

Malcolm Coxon
Cassette Software
23 Bristol Ave.
Levenshulme
Manchester M9
M7G 3NU

Caring needed

CAN anyone help with soft ware? hardware/adaptations for use by handicapped children?

S. Bannisterwood
Wrexham Children's Home
17 Victoria Rd
Wrexham
LL11 5RQ

Banbury club

I WOULD be grateful if you could place in your letters column a call for other users to join a new Dragon club in Banbury and the surrounding area. They should contact me at my address or on (0295) 83000.

J.H. Pester
47 Burroughs Rd
Banbury
Oxon OX19 9HU

Back issues

IN ANSWER to the inquiries about back issues, it's slipped your mind that Peacock have acquired Dragon User back-

This is the chance to air your views — send your tips, comments and complaints to Letters Page, Dragon User, 12-13 Little Newport Street, London WC2H 7PP.

issue stock. Prior to January 1986, the issues still available are: '84/85; Feb/Mar/May/Jun/Nov/Dec '85/86; Jan/Feb/Mar. They are priced at £1 each, post included.

We do try to maintain a complete collection of available Dragon periodicals, and I hope you'll mind if I also mention that we can offer copies of all editions of Dragon Monthly, and printer dumps of Radio Dragon.

Harry Wheathouse
Peacock
48 Queen St
Bridgwater
Somerset
BS9 1AS
North AV32 3AS

Correct Pokes

THE POKEs listed for Madness and the Minotaur in the July issue are somehow wrong. Here are the correct ones:

POKE \$072 138 (\$201 hex)
POKE \$072 285
POKE \$074 151
POKE \$075 5
Machine code:
\$20241 LDA #8F7
\$20244 STA <803>

The poke \$020 sets the number of points that need to be collected to win. I would like to thank Mrs. Pauline Hasjani for pointing out the errors to me.

Simon Hargrave
Crawley Hill Farm
Uley
Dorset
DT2 6LJ 5SM

Hyperun error

THANK YOU for publishing my letter, "Pokes galore" and "Screen change" in the Feb and July issues of DU. Thank you also to everyone who has bought my Hyperun program, which is still available at £3.95. However, there were unfortunately some errors printing, and I have come up with shorter versions of A and B instead.

Program A
\$00FF:POK0 1264:POK0
127 8 EXEC 48941

Program B
10 POK0:COMBO 10:SH00:
READ:POKE 124 NEXT:
EXEC 11 DATA 188 180 148,
124 21 153,1 103 125 121,153,
151,153,PUN

In "Screen Change", the PRINT 16 B command should be followed by a comma not a return, bringing the QBasic statements. There are some uncorrected errors so I'll point out that there shouldn't be any letter "O"s. This should clear up any confusion.

Paul Borgh
88 Moorcroft Road
Aylesford
Kent
ME20 6EP 0623

Harry D. Taylor II
Chemical Engineer
Alameda, CA
94501
Joined Astra One
October

WE have a problem with OS-9: nobody in the UK is licensed to market it, so, if anybody is, we have yet to hear about it. We would like more contributions and reviews on professional systems, and would like most interested to hear from anyone who can help on either subject.

Printer connector

OVER the last few months there have been several inquiries both to "Letters Page" and "Dragon Adverts" concerning the interfacing of the Tandy TP-10 Printer with the Dragon computer.

Point-to-point/Indirect or parallel however can be done on Dragon. My suggestion is to disassemble "OS-9 Operating System" and one can manage.

Point-to-point/Indirect or parallel however can be done on Dragon. My suggestion is to disassemble "OS-9 Operating System" and one can manage.

Parallel: agree. However, the expression de mes sentiments distinguishes.

Mr Patrick Johnson
2 Allée du Capitaine Moncet
21150 Venarey-les-Laumes
France

As Parallel/Indirect

Dragon User People's Chart

If THIS goes on, we'll be re-running *Juxtaposition*! The Dragon's Gotta Go popularity just continues to reassess itself. See Mike Gerrard's Adventure Trail this month for some hints. If your names are above to crack.

Or you could write to Paul Davidsen at 212m Dunnington Road, Glastonbury, Somerset, UK, BA10 5PR. He hasn't sent an anagram, exactly - he just wrote in the space "I have just finished *Adventure Trail*, and if anybody wants any help, send me an S.A.E. and I will help them". To Paul. No points, though.

A special mention to Keith Turner, who not only used most of his top three letters, but listed the ways he did it, as well. They say DDOOP! But this month's anagram winner is S.A. Golding of Chiswick, London, who not only used all his letters up, but says exactly what the editor is always saying — "The Dragon user should use cold light". You know, cracking words. Sometimes.

Found another great program? Discovered new depths in an old favourite? Send us your list of five favourite programs — games, applications, utilities, disk or tape — in order of preference, on the form printed here (or make your own — thousands do).

Moreover, if you can devise a witty apt anagram from the letters of your own name (here you need not use all the letters), you may be the winner of £25-worth of Microdeal software.

Results August 1986

1 Juxtaposition	(Wintersoft)
2 Shocktrooper	(Microdeal)
3 Beam Stalker	(Micro Vision)
4 Jet Set Willy	(Software Project)
5 Rommel 3D	(Microdeal)

Chart Eight

Voting for Chart Hs. 8 closes at 1pm on Friday, 11th September 1986. Entries received after that time will not be eligible for inclusion in that month's voting. The editor's decision is final. Only one entry per individual per month will be allowed.

My top 5: Voting Month 7

- 1
2
3
4
5

Name

Address.....

My phrase is:

THE DRAGON COMPUTER SHOW

Returns to Wales

Saturday 4th October Cardiff — Wales Airport 10.00 — 4.00

Another sensational show where you can meet the leading retailers of Dragon Software, hardware and peripherals.

Adults £1.00
Children & OAPs 50p

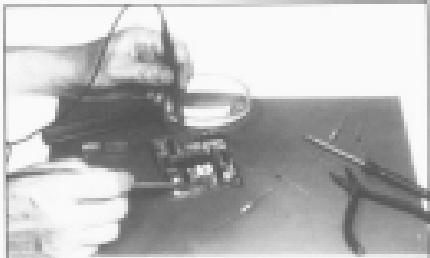
Ample car parking
Refreshments

If you would like to demonstrate how you use your Dragon in an interesting or unusual way please contact John Penn.

Further details available from
John Penn
Bordon (04203) 5970

News desk

If you have any new products for the Dragon ... software or hardware ... ring the News Desk on 01-437 4245.



Non slip mat

TRYING TO CATCH you from slipping, you step on a mat. It's the next best thing to a banana skin. The Slipslip mat has put a stop to all that slipping in for the table or the workshop and has the answer to all those slippery problems that can occur in the workshop, lab, office and home, even, who knows? the studio carpet, if you use it irresponsibly.

Slipslip is made of an inherently tacky material which holds objects placed on it, according to our reports, as it

glued, without leaving any residue on the objects or the table. The tackiness can be restored when flapping by washing the mat in warm soapy water to remove dirt and debris. It can be supplied in various sizes in thicknesses of 2 or 3mm, and can be cut to size with ordinary scissors.

Call the supplier, Cobain Ltd., 32 Ludlow Road, Guildford, Surrey GU2 5AW or (0483) 525200 for more information and prices.

Free Dragon Cards

Clean Electronics have been clearing out their grained, special cupboard and have discovered a hoarded bundle of Nansen Systems Corp reference cards for the Dragon 30. These handsome, full-colour 10-page pads, with cold-touch, contain ready reference information for system commands, BASIC characters, Mathematics and special keyboard keys, instructions for simple graphics and music, BASIC internal codes, memory map, key layouts and special tips, printed in black and white and spot colour in white with a red surround.

One of these cards can be yours. You have to be the first 2000 Dragon User subscribers to send a large SAE (A5 size preferred), enclosing a QL address label with your subscriber number on it as proof of identity.

(The number will be just above your name on your address label), to Dragon Card Offer, Clean Electronics, 11 Bury New Road, Prestwich, Manchester M25 8UZ.

Trojan disk

PARADISE, Ltd. has converted the software supplied with the Trojan lightbox, to run from Dragon-300m on disk. The conversion is supplied on disk, with an assembler source file, and costs £13 all inclusive from the company's High Wycombe address.

On special offer from Paradise are some copies of the Shirewood and Somerville book loads for the Dragon, for £5 (UK overseas). This, they tell us, is the publisher's final possible reduction...so if you want the Dragon, don't wait any longer.

Paradise, 21 Mycenaean Lane, Woodburn Green, High Wycombe, Bucks HP12 9PD.

Bargains for the brave

Principia Distribution Ltd. have a number of working and non-working Dragon 30 units at knock-down prices.

Said Mr Borrelli at Principia: "We have 30 working Dragon 30s, complete with the power pack, which we are offering for £125 each, and 60 non-working units with minor faults and no power pack, which we are offering for £115 each. We have had to remove the top-cover from all the machines to avoid copyright problems, because they are all out of warranty — there are no guarantees available. Because of this, we really want to sell them to personal customers only, so that they can see what they're getting and have the situation explained to them."

"A someone is really keen and can't get along to us, they can ring up and enquire. We

also have 10,000 square feet of electronic surplus stock here, if people want an incentive to come by."

Principia Distributors Ltd. are at the Haybridge Centre, Castle Road, Camden Town, London NW1 (the bus stop up from Euston Station on the Northern Line) and the phone number is (01) 267 6811.



July shortage

BECAUSE of the dramatic response to Dragon User's subscriptions offer, some people are fed that their subs are starting in August. The reason is simpler: we have run out of July issues, so there won't be any available as back issues.

To help out readers who have been building up a collection of DUs, we will photocopy any backissues from July 1986 for the price we normally charge for issue 30, irrespective of length. Where a number of photocopies are included,

Journey Planner: holiday planning plus in BASIC.

Extra graphics for the Teacher's tales.

Plus adventure text, Dragonsoft Missionary 471, The Yonan Factor, Personal 3-D, Arcade Arena, Dragon Answer Competition (April winner).

The Machine Code series, unfortunately, did not appear in the July issue.

Please allow plenty of time for delivering photocopies, as we have to fit in copying in around everything else — if there is a rush, that could take several weeks.



The main article in July's issue was:

Carver: a long-machine code game.

Disc Drives: basic advice on choosing a disk drive.

Missing Persons

AFTER a disastrous explosion in the Dragon User address line, we have lost touch with writer Geoff Stoddard and Budget People's Chart winner Jason Lee. Please write and let us know where you are.

Dragonsoft

New software for review should be sent to Dragon User,
12-13 Little Newport Street, London WC2H 1PF.

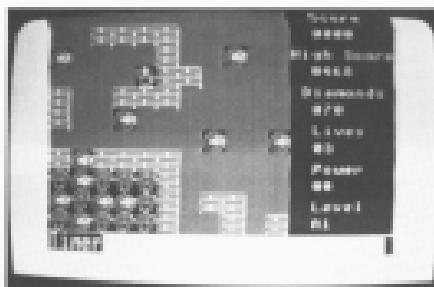
Too much play!

Program: Boulder Dash
Supplier: Baby
Price: £10.00
Dear Helen Armstrong
(Dragon User),

I'm afraid I must write in apology for not getting all my copy in one timelimits (but, you have to understand, it's not my fault). You see, one of the games you sent me recently ('Thunder Crash') by Baby is so good that I haven't been able to stop playing in since I got it!

It really puts you in a bind because a game which is so good that I spend much time playing it I don't get around to reviewing it.

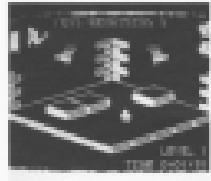
For your information it's a multi-screen game which involves running around collecting gems. Yeah, I know what



you're thinking. We've looked on another Mario/Minner/Cave, but Helen, believe me, it's much more serious than that. Each screen on this takes up about two-thirds screens, and in seconds as you move,

The first few screens are definitely easy just had to drop the boulders out of the way so that I could get to the gems.

Having spent many hours desperately trying to score as much of this adventure as I could before I reviewed it I must admit to being addicted. My highest score is only 30% and I suspect it'll be a good while on it already. There are many things which are not obvious at first glance, it pays, as in all adventures, to be methodically careful in examining your surroundings. Objects which seem to have served their purpose and have been discarded are usually missed after travelling over mountains and rivers. It pays to know a little about temporary events as some of them have hidden off-interest places. The program allows a full SOUND/LOAD facility which is useful, especially just before you try something that may or may not seem likely. FLEXI commands may also be accessed in mid-game provided that they only occupy the Utility Command Space (12700-12879). It is a shame really



making sure nothing hangs on my head, get the gems, and go to the exit, but then later on I came across screens with no gems and realised that the only way to get them was by dropping boulders on them because that's what I did a number of times until I turned into nine pieces.

Then, there was the reader

that this game is only available from FLEXI users, but the sheer size of the program prohibits it from being cassette based.

It is difficult to give a fair appraisal of an adventure game without describing the events which take place in it, but that might spoil the game. Quite

boring and the likes, oh God, the scroll! I have blisters on my fingers from using 'Z', 'X', '<' and '>' to move the superb graphics man around the screen. My eyes are sore from staring at the screen until late. My phone has stopped ringing three figures, I've spent so much time at the keyboard.

So, apologise once more for not getting the review done. Perhaps you can get something from this lesser-known site?

Yours, Jason Orbaum

FDS Are we still on for Friday or are you raising that jerk? The Expert?

Forget it, boys. I'm being taken to La Grecote or a tape cassette wholesaler there (Beecham). Come together and buy yourselves a sandwich — did.



Addicted

Program: The Curse of
Carmack
Medium: FLEXI disc only
Price: TBA
Supplier: E. Hunter, 48
Greenhill Rd., Chorlton, Bury,
Lancashire BL9 2LL.

It is comforting to know that no matter what it expected you, in an adventure, the world you can do is to fall off your chair, although some adventures become so engrossing that your heart rate suffers at moments like these. Something akin to magic separates the good adventures from the bad. Some of them have such an air of mystery and unique about them that you hold your breath before killing the Elder Key, knowing that it may be the last time you are allowed to do so.

The Curse of Carmack has all of these ingredients and more. There is STV devoted to dynamic characters, bewildering locations and puzzles for you to explore and exploit. Knowing that the Bear may have been everywhere will be frightening to do. Maybe he could have helped you in your quest to save the Kingdom of Balakit against the evil of the Wizard Carmack. That I am not for you alone to find out.

that this game is only available from FLEXI users, but the sheer

size of the program prohibits it from being cassette based.

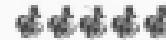
It is difficult to give a fair appraisal of an adventure game without describing the events which take place in it, but that might spoil the game. Quite

silly this is an unusually

large and complex program

which I found riveting and I don't see why you shouldn't as well.

Roy Coates



the soccerer — it's bring!

The screen jumps whenever something is eaten, or a new room is entered but after a while this becomes almost beautiful.

I really have very little else to say. This is one of a game that's only half way there. It's as if the programmers saying "This is what I've come up to, but I've got to get rid of that really annoying bloke and I just have to put that ingredient in."

"Yeah, where are the monsters, Baby?"

Baby are amongst my favourite Dragon software houses. They're charming, great fun, and they know what they've put in a dutiful. I think they know what this review will going to be like. If not, sorry kids, but my mate finished up to level four on his first go!

Jason Orbaum



Monster shortage

Program: Temple of Doom
Supplier: Baby
Price: £5.00

Ho ho! I've got one up on The Expert! He said that Baby had released a game 'similar to ALI-ALI'. Well, he was referring to Temple of Doom and he is right. WORMS! The game is nothing like ALI-ALI. Instead it's more like Knight Lore!

Right, now that I've had my goot onto the game itself. It's a '3D' arcade game' which basically involves running round a three dimensional maze collecting food and keys before strength, and that like every sort of life itself, run out.

The graphics are very nice, bearing a slight similarity to The Sword and the Sorcerer in terms of iconography (is that a word?). However, it suffers a similar fault to the sword and

Counties Quiz

J. Hewitt takes a topographical around the UK and Ireland.

THIS PROGRAM tests you on your knowledge of the map of the United Kingdom and Ireland. The program has four levels (to undergraduate or conversate), a reinforced character set, a true scale map of the British Isles covering more than one PMODE, 4 screens, computer-style graphic display, questions that are not repeated during a game, scoring and percentage facilities and settings on your expertise (or otherwise).

First type in the program and then RUN. It will ask for the number of questions you wish to answer. Enter two digits and press ENTDR. If you make a mistake you can only press the backspace after typing both digits. You must have more than 10

questions in any one game, to allow an accurate rating.

After a short wait the British Isles will be displayed. If the county in question is to the north of the map (essentially Scotland) you will see the top four-tenths of the map. Similarly the same is true for the southern part of the map. This is because the map takes up five graphic pages and only four can be displayed at a time. The program will draw and fill a county, apart from some of the islands which have boxes round them. You then have to name the county.

Each county is represented by a three-letter code, which is normally the first three letters of the name. See accompanying table for complete list of codes. Type in

THREE letters and press ENTDR, and as before, if you make a mistake you can press backspace until you have entered all three characters, then delete them all.

Only the regions/forty counties are shown on the map of Scotland.

Your score, and percentage, will be updated, you will be prompted to press a key, and then another county will be shown until all your questions have been asked. Press 'Y' for another game.

If all the typing seems too much then an enhanced version, with auto run, can be obtained for £3.00 from J. Hewitt, 29 Hammonds Craft, Church Meadow, Ilfracombe, Devon EX18 0PG.

Table of Counties

1. Anglesey	—ANG	29. Dumfries and Galloway	—DAG	46. Leicestershire	—LAD	71. Ross-shire	—ROS
2. Ayrshire	—AYO	30. Durham	—DUR	47. Leicester	—LD	72. Shetland	—SHL
3. Bedfordshire	—BED	31. Dyfed	—DYF	48. Lincolnshire	—LET	73. Shropshire	—SHR
4. Berkshire	—BER	32. Essex	—ESU	49. Lincoln	—LIM	74. Sligo	—SLI
5. Borders	—BON	33. Fife	—FIF	50. Lancashire	—LBN	75. Somerset	—SOM
6. Buckinghamshire	—BUC	34. Gloucester	—GAL	51. Lancashire	—LGD	76. South Glamorgan	—SGM
7. Cambridge	—CAM	35. Cheshire	—CHL	52. Lothian	—LOT	77. South Yorkshire	—SYO
8. Cawdor	—CAB	36. Cleveland	—CWE	53. Louth	—LOU	78. Staffordshire	—STA
9. Cavan	—CAV	37. Cymru	—CHY	54. North	—NAN	79. Stratford	—STR
10. Central	—CEN	38. Hampshire	—HAM	55. Monmouth	—MON	80. Sutton	—SUF
11. Cheshire	—CHE	39. Hereford and Worcester	—HAW	56. Monaghan	—MAY	81. Surrey	—SUR
12. Clare	—CLA	40. Highland	—HGD	57. Mayo	—MEA	82. Tayside	—TAY
13. Cleveland	—CLB	41. Humberside	—HUM	58. Meath	—MEA	83. Tipperary	—TIP
14. Clydesdale	—CLB	42. Isle of Man	—IMI	59. Mid Glamorgan	—MGL	84. Tyne and Wear	—TAW
15. Cork	—CON	43. Isle of Wight	—IWG	60. North	—NOR	85. Ulster	—ULS
16. Cornwall	—CON	44. Kent	—KEN	61. Nottingham	—NFT	86. Warwick	—WAR
17. Cumbria	—CUM	45. Kerry	—KER	62. Northumbria	—NMB	87. Waterford	—WAT
18. Derbyshire	—DER	46. Kilkenny	—KIL	63. Nottinghamshire	—NNT	88. West Glamorgan	—WGL
19. Devon	—DEV	47. Limerick	—LIM	64. Notts	—NFT	89. West Mercia	—WMC
20. Donegal	—DON	48. Limerick	—LIM	65. Offaly	—OFF	90. West Midlands	—WM
21. Dorset	—DON	49. Liskeard	—LIS	66. Offaly Is	—OFF	91. West Sussex	—WSU
22. Dundee	—DUS	50. Lancashire	—LAN	67. Ossory Is	—OSS	92. West Yorkshire	—WYO
				68. Outer Hebrides	—OHE	93. Westmorland	—WMX
				69. Oxford	—OOF	94. Wexford	—WIC
				70. Powys	—POW	95. Wiltshire	—WIL

10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 259 260 261 262 263 264 265 266 267 268 269 269 270 271 272 273 274 275 276 277 278 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Books and Machine Code

From Diffbot.com, take your business to answer some common questions.

I DOUBT that there have been many new books published specifically for the Dragon since the demise of Dragon Data in '91 but as the list that I have put together recently almost doubles the listed publishers (June 1992), I think that it is time that we had an update. The dates are the issue of "Dragon User" containing the reference, followed by the page number. Other information: dates only include the earliest reference as far as advertising goes. If anybody readers know of any other books, please let us know in the comments.

Regarding availability of the books, I find that library bookshelves still carry a large range of Dragon books. General bookshops are another good source. The *Dragon* [2003 and later] can often be found on their shelves as well as in good home computer shops — and the *Tottenham Court Road* alternative bookshop also sells it. Also while trying to purchase it having particular problems [addressed elsewhere in the document].

The Dragon 32 Memory Map is available for \$15 from Micro Computer

Services, NJ; Jerome Pevsner, Lakewood, NJ; MEGO-BUFL. I will have some programs of mine at the Dragon at the publisher's final sale by auction, June 14, 1999.

Machine Grade

The reason for putting together the booklet was that the most common questions that readers write to us are: which machine code book, which Assembler, where can I get a list of Dragon ROM addresses from, closely followed by which 62691-111?

The machine code book would also serve as the beginner's guide that a now defunct publisher commissioned me to write. Page, understandably, abandoned because of Dragon Data going under. However, it was becoming apparent to me as I was writing the book that I was being asked more and more to write about the "more esoteric" aspects of graphics and sound than for it to be truly a beginner's guide and that is what subsumed many of the problems. As one of the parents who stumbled through Dragon Data said, "But what

are the graphics like. That is what my son would want to do.

As with anything in life, what suits one person doesn't suit another. I came into 6502 Assembler via Leventhal on an 8080 machine. I was the first person at the site to write an Assembler program (MASM80) (using the language of that time) and I found that neither Leventhal nor the manuals assistance helped those early stages with the most fundamental aspect of 6502 machine code — what to do about, with, why the hardware did it! I had as Leventhal always seemed to do (in 8080 SIC100) and crashed sooner or later.

The words used in a book, like sentence sets all suffer from those idiosyncrasies that put a barrier between us and perceiving. The hours I spent poring over those early (and later) historical chapters — I thought that I would indeed learn — only to discover that 90% of it is not needed, and much of that becomes much more understandable when one has been reading for a little while. Then one can go back and realize the cause and effect and better ways of doing things.

Because of the architecture of the machine and such like.

As for the books... not possessing copies of every machine-code book, I cannot give a complete opinion. My opinions are also tempered by my programming background. David Barnes' 1980 *Machine Code Programming* received a favourable review in the November 1984 issue. I have never seen it about and, not particularly needing a copy apart from curiosity, have not gone out of my way to get hold of it. Being published later than most machine code books, it would seem a useful prospect.

Fewer mistakes

The books that I work from are Inside the Dragon and the Leventhal and Zaks books. Inside the Dragon was a revelation to me as so many books contain so many errors, it is fairly easy to spot an error in a BASIC program, but finding a bug in possibly 8000 lines of machine code is almost impossible! I've mainly BASIC books with lots and pieces of machine code (including Sunshine books) and are notorious for this. I haven't tried all the machine code in Inside the Dragon, but the only mistake I have come across in this well thumbed book is on page 215 where it says: 'The cassette gap flag byte being 100 for "multimode" whereas it is actually 000 (joined on page 248). It was written by a Dragon employee and contains much useful Dragon hardware and ROM information.

The Leventhal/1980 Assembly Language Programming and Zaks' Programming the 68000 are no help to the Dragon programmer as such. I find the strength of the Leventhal is the detailed examples it gives when describing each instruction and, even more valuable for patching programs when testing, is the full, numerically sequenced assembly table in the Appendices. I reckon that that table alone has paid back its £14 cost many times over for me in the past! The Zaks is the most recent of the two books I read that it contains much more easily assimilated programming examples for beginners than the Leventhal and with a page per instruction, the instruction code body displayed at the head of pages, it is a much easier preparation for the quick check when coding!

Do skip bits of a book and go back over it later if you are struggling — our learning patterns differ so much. So many books seem to be so technical at the beginning that we can get bogged down and give up.

The right tools

I think it is essential that would-be machine coders purchase the tools for the job. They are very reasonably priced these days and can only help you get to grips with machine code more quickly. I consider the tools to be a cassette, an assembler and a monitor.

I believe that a lot can be learnt from others. There is no one way of programming. By possessing a DISASSEMBLER,

chunks of machine code can be disassembled (turned into 'look-alike' source code) and examined even though the source code is not given in articles, etc.

The ASSEMBLER allows you to write source-code and assemble it (= translate) it to machine code for you.

ASCOM/TOP/Hypercard you can test a machine code program. In BASIC you can TRON (trace on). A monitor will help you trace through the path that your machine code is (in the clouds, unashamedly) taking.

There are still two commonly available sets of tools available on the Dragon — DAGMAR/DEMOM (from Computerware) and ALLEGRA (from Gossamer). I am a dedicated CHIPSAM user and have never seen DAGMAR/MON in use, probably tried it, no reward, opened up the old reference manual plus etc. Inside the Dragon uses CHIPSAM for its examples whereas most other books use the rather variable DAGMAR. Both are available on cartridge. I know that CHIPSAM is available on disk when the cartridge port is needed for a disk controller. I do not know about DAGMAR. DAGMAR/DEMOM was reviewed briefly in the September 1983 issue; ALLEGRA more thoroughly in September 1985. Looking over my index, there are further references to CHIPSAM in the July 1984, October 1984 and June 1986 issues.

Perhaps now you can see why asking for recommendations of a machine code book or an assembler presents such a difficult problem.



DRAGON BOOKS

List compiled
5th July 1986



Title	Publisher	Author	Review (pp)	Date	Page
15 Programs for the Dragon 32	CHIPSAM	various	various	various	various
20 Programs for the Dragon 32	CHIPSAM	various	various	various	various
68000 Assembly Language Programming	Computerware	Leventhal	See 19/19	Sept 1983	19
68000 Machine Code Programming	Dragon	Barnes	See 14/19	July 1984	19
Advanced Micrographics for the Dragon 32	Software Options	Price	18/18	July 1984	18
All about PDS	CHIPSAM	various	various	various	various
Analogy on the Dragon	Dragon Works	various	various	various	various
arcade Games on BASIC (TandyDragon)	Dragon	Gary Bell	var	var	var
Artificial Intelligence on the Dragon	Dragon	David Bell	var	var	var
Basic for the Dragon 32 made easy	Dragon	various	var	var	var
Beginner's Guide to PDS for the Dragon 32	Software Options	Leventhal	18/18	July 1984	18
Basic on the computer and your Dragon	Dragon	Leventhal	var	var	var
Books Inside the Dragon 32	Dragon	various	var	var	var
Breakthrough for the Dragon 32	Dragon Pub. Assoc.	Lazarek	See 14/19	July 1984	19
Color Computer Graphics	Dragon	various	var	var	var
Color Computer Graphics (Disk)	Dragon	various	var	var	var

Creating Adventures Games for your Dragon Interface Positions.	Gillard	Jan 10/411	
Iv. Nation Beginner's Booklet for the Dragon Honeyfield		May 10 (Dragon advert)	
Dragon Computer (The)	Whitton	Jan 10/412	Dragon advert
Dragon Correspondence	VMG Comp.Services	January	Jan 10/413 advert
Dragon Machine Code	Sims	January/February	Feb 10/414 advert
Dragon Machine Code/Assembly beginners	Melbourne House	May/June 10/415	Mar 10/416 advert
Dragon Magic	Faulkner	October	June/July 10/417
Dragon Fragments (The)	Brancke	See	January 10/418
Dragon Programs	Frederick	September	Feb 10/419
Dragon Trainer (The)	Brennan	Lloyd	Jan/February 10/420
Dragon 22 User's Guide (The)	Brancke	James	January 10/421
Dragon 22 Basic & Games (The)	Brancke	James	January 10/422
Dragon 22 Games Master	Brennan	Brain Box	January 10/423
Dragon 22 Machine Code for Beginners	Copeland	James	Feb 10/424
Dragon 22 Memory Map (10 pagefull book)	Wilson Comp.Services	Ellis	April/June 10/425
Dragon 22 Programmer's Reference Book	Melbourne House	Hayden 2/4	June/July 10/426
Dragon 22 Reference Booklet (The)	Elgan Electronics		July 10/427
Dragon 22 and how to make the most of it	Brancke	Sinclair	January 10/428
Dragon 22 - a Programmer's Guide	Greener Software	Gerry	Mar 10/429 advert
Dragon Games for the Dragon 22	Interface Positions	James	May 10/430
Easy Programming for the Dragon 22	Dunn	David Glass	January 10/431
Enter the Dragon	Melbourne House	Garton	Jan 10/432
Exploring Adventures on the Dragon	Dickson	Herrard	Feb 10/433 Aug 10/434 advert
FORTRAN for Dragon	Heaton	Holley	Mar 10/435
Forums 100 (1000)	Wright	Holland	Mar 10/436
Further Programming for the Dragon 22	Shire	Stewart-Vance	Jan/February 10/437
Gateway to Computing with the Dragon 22	James	Stewart	Dec 10/438
Getting the most from your Dragon 22	Pengate	Swanster	Jan/February 10/439 Jan 10/440
Great Book of Games for your Dragon	Portman	Watson	March/April 10/441
Jump Ahead with Color BASIC	Radio Shack/Tandy		May 10/442
Net Programs to Feed your Dragon	Signet Books	Jones	Dec 10/443 Aug 10/444
Design the Dragon	Software Systems	Kearns	July 10/445
Software 100 (1000)	Dragon Data	Keddie	April 10/446
Introducing Dragon Machine Code	Brancke	Sinclair	Sept/Oct 10/447
Introducing Pascal	Brancke	Allan	Feb 10/448
Introduction Course 100 for Dragon 22/4	Leanne		May 10/449
Introduction to Dragon 22/4 (The)	Dragon Data	Royer	with Dragon 22 card
Learn your Dragon	Tiny Pub. Company	Sims	July 10/450
Language of the Dragon (The)	Signet Books	Simpson	Dec 10/451 advert
Learning to use the Dragon 22	Signet Books	James	Dec 10/452
Learning to use the Dragon 22 computer	Whitton	Brooker	January 10/453
Load and Go with your Dragon	Highgate Software	Hopper/Towne	May 10/454
MC6809 Cookbook (The)	Signet	Kerrigan	Jan/February 10/455
MC6809 Microprocessor Summary Card	Software	Leathem	April 10/456
Rule the Ages of your Dragon 22	Interface Positions	Gillard	May 10/457
Packet Handbook for the Dragon 22	Hicks	Gervais/Holroyd	Feb 10/458
Power of the Dragon (The)	Microsource	Mary-Elliott	May 10/459
Programming the 6809	Sims	Leahy/Labrador	Sept/Oct 10/460
Programming the Dragon for Games/graphics	Software	Phillips	Feb 10/461
Programming the Dragon 22	James	Leahy	Feb 10/462
Reference Card for the Dragon 22	New Systems Corp.	Radio Shack/Tandy	Sept/Oct 10/463
100-80 Color Computer Technical Reference	Radio Shack/Tandy	Chisholm	from Radio Shop
The Pengate Book of Personal Computing	Pengate	Strahan	Mar 10/464
Training your Dragon 22/4	Prentice Hall	Coltrane/Sher	Mar 10/465
Using Microsoft Basic on Dragon (Baldred)	Cambridge Press	Wintersmith	with MicroBasic card?
Working Dragon 22 (The) (T1 Books)	Software	Wintersmith	June/July 10/466

PUT ... EOR

C.C.A. Smith adds an exclusive OR to PUT and shows
service up.

IT HAS often struck me as strange and frustrating that although the parameters for the PUF command include AMD and OPL, they do not include the neurological function — EOP (episodic OPL).

The program shown here corrects that deficiency. There is also a short demonstration program which shows the effect of overlapping columns using EOF.

Within a portion of a graphics screen is saved in an array using GET with the G option. There are a number of ways in which the PUT command may be used to display it. The PUT parameter Displays it exactly the same colour as the original, obfuscating whatever it covers, and SBIT reverses the array colours before displaying. NOT does not display the array at all - it reverses the colours in the screen area specified. With the two remaining parameters - AND and OR - the colour of

Figure 1. AAD-
EMM colour

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少	少	日	日
日	日	日	日
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日	日	日	日

Figure 2C9
Review problems

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

**Figure 3 ECR
matrix colour**

Age	10	20	30	40	50	60
Mean	1.04	1.04	1.04	1.04	1.04	1.04
SD	0.00	0.00	0.00	0.00	0.00	0.00
SE	0.00	0.00	0.00	0.00	0.00	0.00
N	10	10	10	10	10	10

each point displayed is determined by a comparison of the corresponding points in the array and the existing screen area. A table showing array values screen colour and resulting colour for AM3 and CM is given in Figures 1 and 2.

So far so good. But take the following situation: a program has been written in which an x-shaped cursor moves across a colour screen area. The text is saved in memory as text strings, using GDI with the OEM option. Which PutText parameter to use? Obviously not PSET, pixels would always show the text against a green background. In fact the OEM option is normally used, but it does have the disadvantage that the text disappears when placed on a red background.

The solution is to use EDF. Each point of the curve now shows up clearly against whichever object it is placed over in workspace.

equally well with two-colour graphics. Figure 3 shows the effect of mixing different colour combinations.

The BASIC program below loads the machine code routine into memory at address \$A000 and writes a JUMP to the start address in the RAM hex address \$A000. After running the program, the new PLOT option will remain available until there is a cold boot—or the machine is turned off—or until the machine code is overwritten. In the latter case, which should only happen if the interrupt routine is loaded, make sure either to run the CDR setup program or to switch off the utility via **PAGE 4453**.

For the sake of simplicity, I have used 'X' as the substitute as the base parameter, but almost any other letter or (ASCII) keyword could be used if the base type of the data is altered to fit the relevant value.

Core Wars

Ziv Eliraz pits program against program with a game that strains the mind more than the hand.

USUALLY programs have fairly peaceful jobs just running Spreadsheets, Space invaders and the like, but with Core Wars programs they have to fight for the right to run!

I got the idea for programming Core Wars from *Scientific American*, in which A.K. Dewdney explains the subject. Core Wars uses a language called Red Code, which is similar to Assembly, but it has only nine commands.

The purpose of Red Code is to corrupt your enemy's program by bombing it with unpredictable statements and thus forcing it to crash. The programs are held in the Core, which can be defined as a group of memory locations set up in a circle where there is no beginning, and no end. Our specific Core will have 182 locations in which the programs can work. Because of this, the programs will have to be short and efficient as well as deadly.

Before I describe how to load and run the programs, here is a rundown of all the commands. Note that A and B are parameters and not variables. Actually, there are no variables in Red Code.

- 1) **GDT A**: This statement is used to hold data, as it is not executable. It can also be used to stop a program.
- 2) **MOV A B**: Moves the content of address A to address B. This command will move the content of B even if it is a command.
- 3) **ADD A B**: Adds the contents of address A to address B. A is unchanged.
- 4) **SUBL A B**: Subtracts contents of A from B. A is unchanged.
- 5) **JMP A**: Transfer control to address A.
- 6) **JMP A B**: Transfer control to address A if contents of B are less (in a DAT).
- 7) **JMD A B**: Transfer control to address A if contents of B are bigger than C.
- 8) **DIA A B**: Decreases content of address B if A is 0 — jump to address A.
- 9) **CMP A B**: Compares contents of A and B. If unequal, skip the next instruction.

Note: A and B are only integers from -128 to +127. There are three addressing modes in Red Code:

Immediate: A, B symbolise this mode. It means that the number after it will be treated as an integer. DAT #5 will store 5 where the DAT appears.

Direct: Just as it says. When reaching a number in this mode the computer will go directly to the location specified. JMP 5 will jump to address 5 in the Core.

Indirect: A, B indicate this mode. I'll explain this with an example. Normally the command MOV B 1 will take whatever is in B locations after it and put it in the square, while MOV #B 1 will go to relative address B and see what's in there. It should point to

another location, say B. Then the program will move to relative location B, see what's in there and only then, repeat to 7. A good example for this will be the DESTROY program discussed later on.

The action of this program is pretty simple one (something like the Spectreus). The top part of the screen (12 top lines) should show you lines 1 — 14 in the program 0, which are now empty. Right now you can press a few keys that will instantly perform the task they stand for. They are: (Up arrow): Move up through the program.

(Down arrow): Move down the program lines.

(F1): Gets you to the help page.

(F2): Erases the whole core (Good after many battles).

(F3): Shows the whole core situation.

(F4): Loads core situation.

(F5): Saves program currently in memory.

(F6): Loads a program to the memory.

(F7): Completes a test program to the Core.

(F8): Executes the two programs in the memory.

(F9): Prints the text of a program to the printer.

(F10): Lets you look at the Core without running it.

(F12, F3, F4): Lets you edit that line. Type the number and then enter. The line will appear at the bottom of the screen where you can edit it.

To make it easy to try different programs with each other you can't have two programs in the same memory simultaneously. You can tell them apart using the (U) key. Any action done relative to that program (saving, loading, compiling etc.).

There are a few steps to running programs together:

1. Think of a few programs (in this case, two). We'll use two programs by Dewdney: IMP and DWARF. Imp is a very long, primitive program that runs through the memory, destroying everything in its path. DWARF is 1.

It moves from relative location 0 (the command itself) to relative 1, and moves to the next location — which is none other than MOV 0 1! This way the whole memory is slowly filled with MOV 0 1, and any program without proper protection is ruined.

Now Dewarf. This program stays in one place and bombards the rest with changing data, every eight locations. It never hits itself but is unlikely to hit Imp. In this battle, Imp usually wins. Here's the program.

```
DAT -1      "pointer to red barrels
ADD #B -1    "add B to pointer
```

MOV 0 0-2 "move DAT to pointer loc.

JMP -2 "continue the loop.

2. Clear the memory. Type 'N'. An appropriate message will appear if done correctly.

3. Put the programs into the Core. Type in IMP (Press C), a jumper, type MOV 0 1 [enter]. Press C. The computer will tell us who deserves put the program. We'll put it under line 70. After a while you'll return to program.

Type in DWARF as explained with Imp and compile it to location 20.

4. The two programs should be in the memory now. (You can see them with the X button in bank 1, i.e. right joystick up.) Press C. Before running them you must answer a few questions:

How many players: (2-DWARF) — 3 (imp and Dwarf).

Name for player 1: — Imp.

Location: -10 (depends on where you put Imp).

Start at line: 1 (First line in the Imp).

Name for player 2: Dwarf.

Start line for Dwarf: 0 (You'll notice Dwarf starts with a C! Since we didn't want it to die before it's was born, we must start it at the SECOND line).

Moves: (D-WARF) — 290 (If a player loses, the program will tell you, but just in case there's a tie, notwithstanding, the programs will go on for ever).

Delayed (D-255) — 100's short delay to make us slowly see how our program does away.

Display (IMP): If you add 1 to see exactly what goes on in the Core, type C and if you want to see a final conclusion, type N (displaying does take time on Imp).

Hold (F1): Hold should be seeing the core now. Press any key and the battle commences!

5. Wait. At the end of EXECUTION time (see heel) your Dragon will tell you just who won, or if there's a tie.

Sample programs

The display in Core Wars plays a very important role in understanding the programs. The Mainframe version of Core Wars just prints out the outcome of the battle, but however that this version has real time action. At first, the display might not seem too understandable (but a lot of data has to be seen at once). Crashing 182 locations on one screen is impossible, but it is possible indeed. Figure 1 shows how it's done. They show three programs running at the same time — Imp, Dwarf & Gemini. The little increase numbers show

what line the programs were running when the batch ended.

These are two parts to this program. The BASIC (pacman.bas) and the M65 (pacmanmap.p65). First type in Listing 1, the BASIC, and save it. Listing 2 is the hex header for the M65 data. Listing 3 is Hexdata, and save here!

To type intellIMC run the hex loader. Program starts at 270000 and ends at 300000 (yes, this runs with Delta D000). The loader will show you the memory point. Enter the string and hit the checkbutton.

After you've done entering the MIG, save it with **CREATE/SAVEFILE NAME: 207000, 208000, 209000** right after the Basic program. (It checks if the code is in, if not it loads the code from the tape.)

If you encounter any problems while running the program (pressed a wrong key, etc.) you can press **Alt+F4**, type **QUIT** and **ENTER**.

Was this 2010-11 program cited last October?

started sending bytes, Imp copied itself as line bytes and Dennis copied itself into bank 2. When running the program the right joystick selects between the two banks of memory (0x00=bank 1, down=bank 2). Even with 64 characters per line it's not possible to copy the actual signs of the characters (+/-) and this is left between 2 and 21 so use 2 for 3 and 21 for 4. To find out what character is in memory type the display function there twice, then the number it returns (2048 in this case) + 21 = 2069.

The memory does seem to end at this second bank, but as said before when you reach the 'end' of the memory the program simply wraps around to location 0, bank 1. That is why there is no need to say where your program starts in the memory map. Although the display shows, as in the example, 254 instead of -2, when you type in the program type in AS!T 15 -2, not 254. Common. This program copies itself to another place in the memory and handles

```
control to there. By running it fast, with  
display:  
CAT 8  
CAT 20  
MOV #12,B11  
CMP #1,F9  
JMP 4  
ADD #1,-S  
ADD #1,-S  
JMP -5  
MOV -7,H  
END
```

Capture: This is the smart and able answer to trap and the like. It captures img's pointer and stored it in its end. This could be used later on in multitasking where capture can capture its own pointer for protection and itself no one duplication.

DMG +

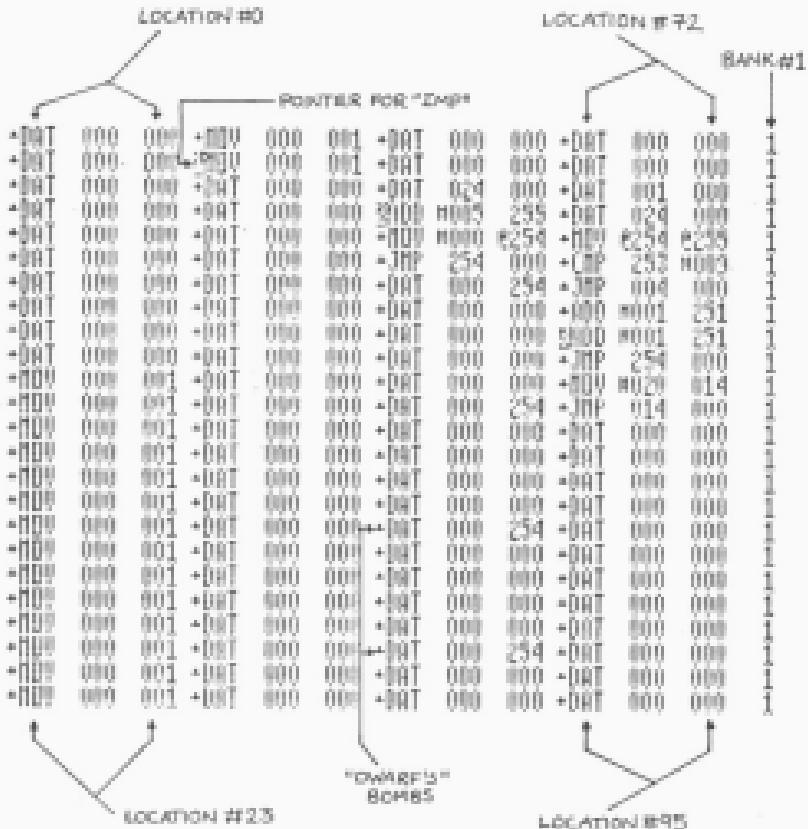
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Figure 1



```

MOV 4 @-5
SUB 4 @-4
MOV 3 @-7
JMP -2
DAT 8
JMP @1
JMP @2

```

If we modify setting a "public" and changing it

it changes. The instant the pole changes, MP is doomed. Captain will cut MP's head off and keep it in his test compartment.

Most of the programs above have been tested, but since many programs can be run at Preparationtime (up to 200) but the cost is only 100 so my best suggestion for an

interesting East Asian knot motifs (see Fig. 10, 11, 12, 13, 14).

So that's it on my behalf. Remember to plan ahead every move in your programs before sending them to the inner reaches of the Core or the results will be disastrous. After all, who wants to be destroyed by a Stunt MDP?

Unit 1 - Page

Writing P - HCC Lessons

```

10 CLS:PRINT "PRINT", "CHECKSUM CHECKER":PRINT:INPUT "INPUT":IF INPUT<>"END" THEN
20 FOR I=1 TO 10:STEP 1:PRINT INPUT:END:EN
30 CS=0:PRINT I;"":CS=CS+INPUT:CS
40 FOR I=1 TO 10:STEP 1:PRINT INPUT:END:EN
50 END:IF CS>0 THEN PRINT "CHECKED"
60 CS=0:END:END

```

11. *Urticaria*

328888	-77.86268862888887E-03	-278	227298	-2298682020288489E-02	-248	229442	-1444482762E-02	1842887
328889	+5451288858785265E-03	-5929	272918	-3011671811118089E08	-605	273045	-10249121E-02	20944281
328890	-68685820652888889	-583	272918	-29887138088702388	-448	273045	-10249121E-02	20944281
328891	-88248488232229743	-980	227247	-283302520888353383	-671	228554	-828231187E-02	211288
328892	-520120447491587640	-912	272918	-80889780888711889	-788	273045	-102308881848678500	209
328893	-8228888711887833	-887	272918	-83110313812888883	-738	273045	-102308881848678500	209
328894	-802588620288888847	-522	272918	-8168227888818027868	-558	273045	-828231187E-02	211288
328895	-81811237888888888	-621	272918	-81882278888024888	-738	273045	-102308881848678500	209
328896	-20885282322888887	-814	272918	-82831129212888883	-688	273045	-102308881848678500	209
328897	-624707005388888840	-828	227252	-303288888348888800	-693	227212	-461196230888888888	209
328898	-38882819482888883	-881	224888	-17822888888888882	-781	227208	-229888878028888888	884
328899	-811035220484888888	-598	272918	-281818888888888814	-738	273045	-102308881848678500	209
328900	-80265783811887838	-838	224888	-8702888887488220783	-658	227208	-461196230888888888	209
328901	-82888888888888883	-588	272918	-42868888888888882	-1833	273045	-102308881848678500	209
328902	-70888888888888886	-583	272918	-29288888888888881	-683	273045	-102308881848678500	209
328903	-28028888888888884	-883	224888	-82874888888888883	-658	227208	-30565814444444482	884
328904	-18277988888888887	-588	272918	-10287488888888882	-1833	273045	-102308881848678500	209
328905	-55695888888888881	-882	272918	-81848888888888881	-718	273045	-102308881848678500	209
328906	-85888888888888881	-582	224888	-23454888888888884	-1833	227208	-461196230888888888	209
328907	-82308888888888888	-655	272918	-85288888888888883	-1554	273032	-102308881848678500	209
328908	-81811182798888881	-988	272918	-15288888888888887	-1943	273045	-30565814444444482	884
328909	-18288888888888883	-287	224888	-22888888888888885	-781	227208	-461196230888888888	209
328910	-81814127918888885	-452	272918	-30318788888888883	-1833	273045	-102308881848678500	209
328911	-18277988888888889	-434	272918	-16228888888888882	-781	273045	-102308881848678500	209
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328924	-82308888888888881	-682	272918	-41882888888888884	-14444	273032	-461196230888888888	209
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328929	-82308888888888881	-682	272918	-41882888888888884	-14444	273032	-461196230888888888	209
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328948	-81818127918888881	-581	272918	-18705848811118089	-1819	273045	-102308881848678500	209
328949	-82308888888888881	-682	272918	-41882888888888884	-14444	273032	-461196230888888888	209
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328974	-82308888888888881	-682	272918	-41882888888888884	-14444	273032	-461196230888888888	209
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328979	-82308888888888881	-682	272918	-41882888888888884	-14444	273032	-461196230888888888	209
328980	-28919288888888882	-769	272918	-44488888888888883	-943	273032	-828231187E-02	211288
328981	-47286188888888881	-674	272918	-80488888888888881	-888</			

Get Logical

Geoff Campbell and Jason Orbaum look at Boolean theory..

THIS This is the month in which we go over AND, OR, XOR, and NOT.

So to Boolean logic, arithmetic which squares many but for absolutely no reason at all, as it is actually extremely easy. We will cover the theory this month, and follow it up with some practical applications next time. For those of you familiar with the GET and PUT commands in Microsoft Extended BASIC on the Dragon through why the heck you should be programming in BASIC anymore is totally beyond us! The commands AND, OR, XOR, and NOT should need very little explanation. However, the Dragon pays no mind and body there follows an explanation of AND, OR, NOT and the ever so mysterious XOR.

The instructions are all BYTWISE, which means that, although they work on bytes, they're part of bit-to-bit operations on individual bits within the two original bytes. For example, we might as well start with the NOT instruction, which is nothing more than a one's complement. If we have an byte A, NOT A is the one's complement — see last month's article. This is expressed as ~A.

If we want to express the value C as the logical AND of two values A and B, we write C = A AND C = A * B, which corresponds to the arithmetic multiply, or means that will hopefully become clear. To work the value out, every bit in C is set (=1) if both bits in A and B are set, otherwise they are reset (=0). Thus A = 01100111, and B = 00011101,

$$\begin{array}{r} \text{Then } C = 01100111 \quad 00011101, \text{ or} \\ \hline 01100111 \\ 00011101 \\ \hline C = 00010001 \end{array}$$

Moving lightly on, the OR instruction is very similar. It'd be 0102 would be 0 + A + B, which is, obviously, equivalent to the arithmetic add instruction plus, along with the previous allusion to arithmetic, will be explained a few lines later. The OR instruction sets the result in the result either one of the bits in A and B is set, even merely the bit. Hence, using the values as before, C = A + B becomes:

$$\begin{array}{r} 01100111 \\ 00011101 \\ \hline G = 01111111 \end{array}$$

This connection with arithmetic is fairly interesting, if only practical side. That take any value other than zero as being true (or set) and zero as false (or reset), we can move along like has happened and, taking each pair of bits, perform the relevant arithmetic operation to get the same result. The tables below illustrate this, as well as giving all combinations of bits.

A	B	A + B	A	B	A * B
0	0	0	0	0	0
0	1	1	0	1	0
1	0	1	1	0	0
1	1	1	1	1	1

Now, all got that? Good. We can now move onto the most interesting instruction, Exclusive OR, XOR for short. This has no symbol that we can remember so forget the arithmetic connection for now. With XOR, a bit in the result is set if one or the other, but not both, of the source bits is set. It can be expressed in terms of the preceding three instructions, as:

$$C = -(A + B) + (A * B)$$

Going back to our previous figures, we get:

$$\begin{array}{r} 01100111 \\ 00011101 \\ \hline D = 01101100 \end{array}$$

Simple eh?

We will cover practical applications, which are legion, at a later date. And that is about it for this month, save to tell you that next month's is a VERY important episode in our existing series!

Next month we will be publishing a comprehensive index of all the commands necessary for simple machine coding on the Dragon, along with a revised description of each command. That marks the end of this first set of Machine code articles but after a one-month break we'll be back with a second set to explain all the really useful stuff. New sound, graphics, interrupts (maybe!), and data processing.

Scott Adams Adventures

... and Jason Orbaum starts revisiting the Adams family of adventures.

So then, to the top of the adventures
ADVENTURELAND.

The story: you find yourself in a mystical land of dragons and magic, and the aim is simply to collect hidden treasures and store them away.

The adventure theme is very good; it's hard to play as a first, because although it is not as easy as Point Adventure, it does have a set of ground-subtlet conventions which lead to hard-to-notice traps across the entire range of Scott Adams' adventures (but action-adventure as a whole, the problems are more clichéd, but it must be remembered, these are the originals). It plays very well, and tends to open up at just the correct time. Don't worry if you can't solve the first problems you come across straight away, often, the objects you need come later on in the adventure. In the progress of your adventure you should come across a sleeping dragon, a rather nervous bear, some killer bees, zombies, and nice bit of pyrotechnics. A good game, not too bad, and an ideal introduction to the series. Don't use the hints unless you absolutely have to.

The adventure will be using to print clues as the adventure is simple. Simply read alternate letters and ignore the spaces! The reason they are concealed prevent you from reading it like you don't want to read.

so you'll find it spoils your sense of anticipation when you do finish the adventure.

The hints:

- Cannot catch the fish?
NOHOWEDPATTEYTUHNOOPGAASDNT

- Stack in the maze?
MEARACSDODCEADAAGDRPHEATSPOLEVA

EES

- Cannot get past finished as well?
DYLEOPESTTYTUWAPOMDCTOYHDFL
ATCDBNHR

- Missing a chest?

- GDRDTTHERCDEEEDPDDGDM

- Cannot get ox from grassland?
TEHREFAOCHEHTSLMUAH-ZUC

- Cannot get fertilizer from land?
DGACOMMLEARVUNGRNDGCPDPORL

INFT

- Cannot get river from bear?
SACPERCMAM

- Cannot wake dragon?

NAPFINDOLUSATEEEISOTUOADERD

QJUCM

- Need bear treasure?

IPNUWISLDAEETP

ARMED with a nearly full set of Scott Adams' adventures, we've gotta crack them all, and reflect miserably! However, at this point the letterbox clattered and onto the mat fell the thimble... In a state of jubilant shock we rushed to the closet, opened it, and decided that it was cheating so we couldn't use it. So, what this article intends to do is help you with the earlier problems in these adventures (as the ones we have solved), and provide you with a smart rescue.

Before we start the review here are some general hints and tips in Scott's adventuring:

yourself's games are fairly easy to map once you realize that some odd bit of association actually takes you nowhere!

2) Scott has a wicked sense of humour and loves puns and word play.

3) LP usually means never mind offhand.

4) Not every object always has a use but there are very few red herring.

The adventure will be using to print clues as the adventure is simple. Simply read alternate letters and ignore the spaces! The reason they are concealed prevent you from reading it like you don't want to read.

Mini Logo

Mike Hoasken presents a compact Dragon version of 'turtle graphics'.

LOGO can mean all sorts of different things to different people. It may provide the means of controlling a 'real turtle' as it gundrives its way across the floor of the primary school, drawing shapes at the behest of its infant operators.

Or it may be used to provide a model of recursion in advanced courses in computer science.

Dragon owners have long been able to purchase full-blown versions of the language. And there can be no substitute for the real thing.

But for those whose chief interest lies in turtle graphics on the screen there is no need to jump to using Dragon Basic to produce the required effect. The inability to combine standard Dragon characters with graphics is a disadvantage, of course, requiring that all letters and numbers should be defined as graphics characters. So lines 100 to 160 are taken up with a full set plus square brackets.

Now it may well be that you already have such a set of graphic symbols. If that is the case then the sensible thing to do here is to load your set from some other program, delete the unwanted sections, remember if necessary, and then type in the remainder of the MiniLogo lines. (Conversely, a full set is provided here even though some cannot be recognised by the command structure, in case you have a use for a different set elsewhere in your programming.)

But to begin at the beginning ...

Users who haven't come across turtle graphics (commands) need some guidance, provided here in the opening lines, up to 120, and illustrated as a print-out in Figure 1.

The whole initialisation section, 130 to 660 plus the turtle class B-line subroutine, takes a reasonable time to execute. But by filling the screen first (without the use of any

variables) there is no obvious delay at all and yet the first graphics screen is almost ready to be revealed.

No extra space is reserved, and arrays DIMensioned before getting the Dragon to learn its letters. Then at line 170 PSET(0) can be prepared, with no matching SCREEN command yet. SLD sets the initial position variables, plus R to take account of the Dragon's predilection for working in radians. The GND to 660 take us into action.

Characters, even 'long' ones, are displayed quite quickly on the graphics screen as a command is built up (the successive uses of PSET(0)). To keep programming life simple, this version insists that with all numerical commands there must be a space after the command, before the numbers, and only whole numbers are recognised. Backspace delete is allocated, as is a backspace for deletion of a whole entry. Completion is signalled with CTRl@130 — **"ENTER"** — in line 620.

A certain amount of jiggery-pokery with the color set helps to simplify the PSET and PRIMeetting of the graphics features, as in the clearing of the workspace and disappearance of the turtle in lines 630 to 660.

Next, in analysing the instruction, the first thing is to discover whether it is a single-word instruction (such as PENDOWN) or a numerical expression ('F 100', say). The distinction is made by looking for the mandatory space; the procedure also enables the part which is to be VALUEd to be separated off by line 100.

Then the command is compared with the array of acceptable instructions (DATA of line 160) in the body of lines 110 to 120. If the instruction is unrecognised, it falls through the loop and, in common with some other illegal commands, causes a 'BEEF' signal (line 1040) to be displayed for a few

seconds before inviting a fresh attempt.

At last, three-quarters of the way through the program, comes the easy bit — doing the turtle graphics!

Forward and Back are identical upon their dimension, line 1150 decides on that detail. Similarly, Left and Right differ only by the sign in lines 1200 and 1260.

But PC errors would abound if precautions were not taken to avoid trying to clear on the plastic surround of the TV screen. So lines 1160 to 1200 issue HMOVE instructions rather than attempt any such thing.

Whether the turtle should be visible or not is remembered by the simple index M, one or zero. But there are four mutually exclusive alternatives according to records of movement: none at all is PENDOWN with index J set 1 whereas PENDOWN is the default 0 and the obliterating PUPPER has J 2.

So there are few problems in producing the lines and circles. Many a computer could do as well. But how can the turtle be moved on without leaving a gap in the drawn lines unless they coincided with the turtle outline? This is where the Dragon's PUT and GET come into their own, allowing the turtle to be treated as a separate entity, stored in a memory array. So it can be put 'on top' of the geometry or astroturf being walked on, and removed without leaving any scars.

Just a couple of points of clarification to conclude. You can have to command PENDOWN again after use of PUPPER. And the difference between CLEAR and START is simply that START returns the turtle to the initial position whereas CLEAR leaves it wherever you left it.

So have fun! If anyone accuses you of wasting time you can always explain that you are sweating so on the principles of trigonometry by filling circles into or round irregular triangles and what-not.

Figure 1.

```
10 REM MINILOGO
20 CLS
30 PRINT #36,"A SMALL VERSION OF logo"
40 PRINT "-----": PRINT
50 PRINT "REMEMBER logo COMMANDS:: PRINT"
60 PRINT "FORWARD OR BACK (A DISTANCE)"
70 PRINT "LEFT OR RIGHT (A ANGLE)"
80 PRINT "circle (A RADIUS)"
90 PRINT "penup OR pendown OR rubber"
100 PRINT " hide OR show THE TURTLE"
110 PRINT " clear THE LINES OR start AGAIN"
120 PRINT: PRINT "THE AREA IS 256 UNITS BY 192."
130 REM >>>>>>> Initialisation
140 CLEAR 1000
150 DIM BH(12),HM(10),L8(29),MS(9),S(20,20)
160 DATA F,B,R,L,PENUP,PENDOWN,RUBBER,HIDE,SHOW,CIRCLE,CLEAR,START
170 FOR L=1 TO 12: READ BH(L): NEXT L
```

```

180 REM >> Character graphics
190 L8(1) = "BR104828P20HL5D3"
200 L8(2) = "BR106R4F00NL1FD0L3"
210 L8(3) = "BR86LAH4EPR4"
220 L8(4) = "BR106R4F2D202L4"
230 L8(5) = "BR106R4F2D202L4"
240 L8(6) = "BR106R4F2D202L4"
250 L8(7) = "BR24EN4FB02HL2D2G4L4"
260 L8(8) = "BR106R4F2D202L4"
270 L8(9) = "BR28L2B6L2R4"
280 L8(10) = "BRF0285"
290 L8(11) = "BR1U6B84Q4EF3"
300 L8(12) = "BR1U6H5"
310 L8(13) = "BR1U6F3E3D6"
320 L8(14) = "BR1U6PGUS"
330 L8(15) = "BR24EN4FD4OLAH"
340 L8(16) = "BR106R4F00L4"
350 L8(17) = "BR1U6H4ER4FD00HNF"
360 L8(18) = "BR1U6R4FD0L4S2F3"
370 L8(19) = "BRF028UHL3HUBR3P"
380 L8(20) = "BR1U6L3R6"

600 GCJSUB 460
610 PRINT 460, "PRESS ANY KEY TO START....";
620 IF INKEY$="" THEN 620
630 SCREEN 1,1
640 GOTO 760
650 REM >>>>>>>> Turtle-draw subroutine
660 IF R=1 THEN RETURN ELSE COLOR 5,0
670 RE=E+8*SIN(A); ES=S-8*COS(A)
680 LE=E-4*COS(A); LS=S+4*SIN(A)
690 RE=E+8*COS(A); RS=S+8*SIN(A)
700 LINE(HI,HE)=(LE,LS),PSET
710 LINE-(RE,ES),PSET
720 LINE-(RE,RS),PSET
730 CIRCLE(HE,HS),2
740 RETURN
750 REM >>>>>>>> Compile an instruction
760 DRAW "B03,106,C0E2P92BD2D"
770 C=0: D=""
780 LINE(9+C*9,185)-(18+C*9,191),PSET,BF
790 CS=INKEY$: IF CS="" THEN T90
800 D=ASC(C$)
810 ES="BM"+STRB(9+C*9)+"_191;D0"
820 IF D=21 THEN LINE(9,185)-(18+C*9,191),PRESET,BF: GOTO 770
830 IF D=13 THEN GOTO 930
840 COLOR 5,0: LINE(9+C*9,185)-(16+C*9,191),PSET,BF: COLOR 0,5
850 IF D=8 AND C>0 THEN C=C-1
860 IF D=8 THEN D=LEFT$(D,C): GOTO 780
870 IF D=32 THEN 910
880 IF D=47 AND D<58 THEN DRAW ES+RS(D-48): GOTO 910
890 IF D=64 AND D<94 THEN DRAW ES+LB(D-64): GOTO 910
900 GOTO 780
910 DS=D4+C$: C=C+1
920 GOTO 780
930 LINE(0,185)-(255,191),PRESET,BF
940 IF R=1 THEN 1000 ELSE COLOR 0,5
950 LINE(HI,HE)=(LE,LS),PSET
960 LINE-(RE,ES),PSET
970 LINE-(RE,RS),PSET
980 CIRCLE(HE,HS),2
990 PUT(E-10,S-10)-(E+10,S+10),5,PSET
1000 REM >>>>>>>> Analyses an instruction

```

```

1010 DAS="" : P=0 : Q=0
1020 P=INT(P*1.08," ")
1030 IF P>1 THEN 1090
1040 DRAW "B#210,191;CD"+L$(18)+"B#2"+L$(5)+"B#2"+L$(4)+"B#B"+L$(15)
1050 FOR L=1 TO 900: NEXT L
1060 COLOR 5,0: LINE(210,191)-(255,191),PSET,BF
1070 GOSUB 650
1080 GOTO 760
1090 IF P=0 THEN DAS=CS ELSE DAS=LEFT$(D$,(P-1)): Q=VAL(RIGHT$(D$,LEN(D$)-L
LEN(D$)-1))
1100 FOR L=1 TO 12
1110 IP DAS=B(L) THEN ON L GOTO 1150,1150,1250,1280,1300,1320,1340,1360,
1380,1400,1480,1540
1120 NEXT L
1130 GOTO 1040
1140 REM >>>>>>>> Forward and Back
1150 IF L=2 THEN Q=-Q
1160 EE=INT(E=0*SIN(A)+.5)
1170 SS=INT(E=0*COS(A)+.5)
1180 IF EE<10 OR EE>255 OR SS<10 OR SS>173 THEN 1040
1190 IF J=0 THEN LINE(E,S)-(EE,SS),PRESET
1200 IF J=2 THEN LINE(E,S)-(EE,SS),PSET
1210 E=EE: S=SS
1220 GET(E-10,S-10)-(E+10,S+10),S,S
1230 GOSUB 650
1240 GOTO 760
1250 REM >>>>>>>> Right
1260 A=A+G/R: GOTO 1220
1270 REM >>>>>>>> Left
1280 A=A-G/R: GOTO 1220
1290 REM >>>>>>>> PENUP
1300 J=1: GOTO 1220
1310 REM >>>>>>>> PENDOWN
1320 J=0: GOTO 1220
1330 REM >>>>>>>> BUBBLE
1340 J=2: GOTO 1220
1350 REM >>>>>>>> HIDE the turtle
1360 M=1: GOTO 760
1370 REM >>>>>>>> SHOW the turtle
1380 M=0: GOTO 1220
1390 REM >>>>>>>> CIRCLE
1400 IF G=0 THEN 1040
1410 EE=0*SIN(A): SS=0*COS(A)
1420 IF E+0<0 OR E+0>255 OR S+0<0 OR S+0>173 THEN 1040
1430 PMODE 4,1
1440 IF J=2 THEN COLOR 0,5
1450 CIRCLE(E+EE,S+SS),0
1460 COLOR 5,0
1470 GOTO 1220
1480 REM >>>>>>>> CLEAR the lines
1490 FCLS0
1500 GET(E-10,S-10)-(E+10,S+10),S,S
1510 LINE(E,S)-(255,191),PRESET,BF
1520 GOSUB 650
1530 GOTO 760
1540 REM >>>>>>>>> START again
1550 E=128: S=91: A=0: GOTO 1490
1560 REM MIKE HOCKEM.

```

If you've got a technical question write to Brian Dodge. Please do not send a SAE as Brian cannot guarantee to answer individual inquiries.

Dragon Answers

Blank Lines

I HAVE an early Tandy dot matrix printer which has given me many years of service with my family Dragon. I recently upgraded to the FLD operating system and have found that there is no way to stop a blank line appearing after every carriage return/line feed. There are no 'off' switches on my printer so the solution must lie in software, can you help?

David Thomas
200 Red Street
Munster
North

TO DO THIS to write a new printer driver for FLD. Enter the line listed below into a file called DTPRNT before using the text editor and assemble it into a binary file with ASAM/TANDY PRINTS255:

PRNT	00008
PRST	0073
PRTY	PRNT A
LIN	002H
BIT	+1
REG	0000
ARDOC	0047
PULS	A,PC
DRSY	0000
DRSA	+0
DRBL	0000
DRCHR	0000
INPUT	0000
PRNT	0000
PRST	0000
PRTY	PRNT
LIN	0000
BIT	+1
REG	0000
ARDOC	0047
PULS	A,PC
DRSY	0000
DRSA	+0
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DRBL	0000
DRCHR	0000
INPUT	0000
PRNT	0000
PRST	0000
PRTY	PRNT
LIN	0000
BIT	+1
REG	0000
ARDOC	0047
PULS	A,PC
DRSY	0000
DRSA	+0
DRBL	0000
DRCHR	0000
INPUT	0000
PRNT	0000
PRST	0000
PRTY	PRNT
LIN	0000
BIT	+1
REG	0000
ARDOC	0047
PULS	A,PC
DRSY	0000
DRSA	+0
DRBL	0000
DRCHR	0000
INPUT	0000
PRNT	0000
PRST	0000
PRTY	PRNT
LIN	0000
BIT	+1
REG	0000
ARDOC	0047
PULS	A,PC
DRSY	0000
DRSA	+0
DRBL	0000
DRCHR	0000
INPUT	0000
PRNT	0000
PRST	0000
PRTY	PRNT
LIN	0000
BIT	+1
REG	0000
ARDOC	004

Expert's Arcade Arena

GOODBYE

Well, how about that for a wacky beginning? I don't think any of you expected me to start like that did you? You did? Okay then you crazy bastards, I'm going to start again. Be there! Right, pretend you haven't read this bit. Ready? Then let's go.

(Bursts)

Hi, even better huh? So to business. A letter from someone who signs off 'Gamer Alfonso'. Before I get down to his letter, I'd like to say something, and that is I'm not prepared to receive letters from people writing under clever aliases plus names. I'm the pretentious one here. Not you. Get it?

So, Mr. Games Clever, thanks for your note and here's more for all my readers.

BEASTSTALKER: Code is REGISTER RUBY ROSSA: POKE 2111,123 for infinite lives.

ESCAPE: Code is 'WAAA' but Poke 1840,123 above anything.

SEAM REED R: Crash with RESET button. Then POKE 730,123 twice POKE 1840,123 for infinite lives. EXEC 9893.

CAVERNS OF CHAOS: Type PIGLET on title page E moves on to the next screen.

DEATH MINES OF SIRUS: Codes are CBLH and TLL. Can anyone help me with the achievement parts? — The Expert.)

Mr Games Pretentious Name (poorly) to presentive linguinated program 'C' which breaks into anytown Microdel, Tom Mix, or Pocket Money game.

PROGRAM C:

10 POKE A=CLEAR: 10:FOR I=1808 TO 881:POKE A=POKE,I,NEXT,I,NEXT,I,NEXT 1808 880:EXEC PEEK(154+I)*256+PEEK(154+I) 40 DATA 181,101,181,1,182,48,183,28,184,1,185,181,21,181,34,182,31,183,182,184,1,185,186,28,187,188,12,189,2,188,189,187,188,189,186,185,184,182,183,189,187,188,189,187

Simply put a POKE on line 20 or main line 80 from EXEC to PRINT and the Program will print up the EXEC address.

This should help with the POKEs from earlier columns, and here's a few more that will work with it, all of which give infinite lives!

PERIODIC POKE 1863,125
JET BOOST COLIN: POKE 859877-POKE 869877
TEA TIME: POKE 18686,109
SHOCK TROOPER (repeated by popular demand): POKE 1875,125

For those interested, the Games Alfonso is really Paul O'Rourke, who promises to log into all his computer systems at the following addresses... as long as they send him an e-mail (do you know what you're actually

Writing 'The Expert' at Dragon User
12-13 Little Newgate St, London WC1H 7PF,
with all your arcade tips and tricks.

and letting yourself in for Paul?)

Paul G. Range, 88 Monckton Road,
Pulwood, Westfield, Warrington WA2 4ZB.

Finally, Paul has won an award. The award goes to Paul for "Most Clever 'I Want To Win An Award' Type Letter Ever Sent To An Arcade Column In A Publication Called Dragon User". Congratulations Paul.

Now to Holger Closserman's letter:

May I be so bold as to register a complaint (about me you can't!) — The Expert). It is concerning Shastic Master by Clickteam's Klood job too — The Expert). What I find very annoying is the poor detecting when fighting. For example, the opponent may attempt to hit you even if you are some way off. This also happens with the leg sweeps and the high kick. Could you tell your influence at Clickteam and let them know of the complaint. Else heads may roll!

Well, your complaint is now in print and knowing Dave at Clickteam, he'll take a lot of notice of your complaint (cause they're very keen to please) and I should think something will get done about it. I'll keep you posted.

The Total Eclipse savegame editor WILL work on the DRAGON 32 now. Just type Clear 2803619 before running. Many thanks to Pam D'Acy for saving the day. See you next month.

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COMING SOON

MIKE GERRARD'S ADVENTURE TRAIL

I'LL BEGIN with a long letter from regular reader Matthew Lodge, full of plots, clues and news, probably enough to fill the whole column by itself — maybe this is a take-over bid? Get out! Lodge Clues include how to get the elusive emerald in *Juxtaposition*, for which you must have the cancer unit and the mandarin because, when you're outside the tower where the emerald is you, **PREDATES EQUITY/ADORE TEG/TA GENE/RECEDE POND**. Matthew's wandering where to get a message to **AREMAC EHT EHT EHT**. (And watch for a full solution to this game next month.) On the same game, Mathew comes up with some possible sources for Ceti M, notably in Robert Heinlein's book *Starman Jones*, where a Ceti M is mentioned as a planet, and in *Starman Jones* where there was a Ceti Alpha M planet with unbearable atmosphere.

Watery embrace

In *House of Akyra* Mathew suggests you try lighting in the dark when in the cave, and you should trust the fox and be prepared to follow him. In *Sorceror of Chrysegeia* castle, don't use the Serpent Spell spell to get you inside the castle — go to another entrance instead, you'll need Serpent later. To get your first star: **SEERT TA ERIIF TSAC**.

This busy reader has also been writing his own *Dragon* BASICs, and integrated it into Dragon BASIC, and tells me that there's a chance that Roy Coates' *Machineman* will be using it in an adventure. They're thinking of releasing. Finally Mathew has finished lots of adventures, from *Mysterious Adventures to Scott Adams*, and would like to swap them for new challenges if anyone's interested. Write to Matthew Lodge, 'Main Mail', Holmes Chapel Road, Latch Dennis, Northwich, Cheshire CW9 9RZ. And remember to spell his first name with only one 't' as he doesn't half get cross if you get it wrong!

Also on the look-out for adventures is Greg Southwood, 21 Courtfield Avenue, Lodsworth, Kent ME5 8DR, and specifically for the graphics version of *Castlevania* and *Black Sunburst*, which he's having difficulty tracking down. If you've solved them and want to sell them, contact Greg, who claims to be the most adventure player in the world, which is why he has no finished adventures of his own to swap in return; he's currently stuck in about

50 different ones, he reckons!

Anecdote from reader Ian Pocklett, not send at me but at a French reader, Daniel Morier, who Ian sent 18 programs in a swap they'd arranged, but the return programs never arrived and nor have replies to Ian's several letters asking what's going on. So a warning there for everyone: Ian's letter goes on to list a routine that will let you inspect the data statements in many BASIC adventures, enabling you to look at verbs, nouns, responses and anything else held as data. Type the routine as one complete line, but without a line number: **FOR A = 1 TO 23456:CLS:FOR B = 1 TO 15:READ X\$:PRINT X\$:NEXT:EXEC 41994:NEXT**. The B loops makes this routine print out just 18 blocks at a time, so press any key to get the next block of 18. If you want it to run as is mode, change the EXEC to EXEC 67870. Anyone interested in routines like this and in programming generally can contact Ian at 2 Kestrel Road, Burley, Leeds LS4 2PU.

Bob Barnasoni of 16 Woodland View, Lanivet, Bodmin, Cornwall, is stuck in various places and would like to hear from anyone offering help on *Caveons of Docon* (how to get the mazuhonos and avoid starvation), *Wizard of Xygor* (how to get through the hen-house/tap-door), *Arms of Death II* (how to get anywhere) and *Operation Safeer* (any help on Part Two).

Also suffering in Safeer is Mark Brocklehurst of 1 Park Avenue, Mansfield, Leics, LE6 0HA, who wants to know the code that is asked for after answering Rhythman's questions, which will help him if he's read the last couple of columns. Mark offers help on *Castle Adventure*, *Ring of Darkness*, *Mystery of the Java Star* and *El Diablos* and also asks if anyone out there wants an adventure game freak as a pen-friend. He doesn't say quite how breakish he is, but he seems quite normal from his letter. Mind you, how normal is an adventure player anyway?

Ray Thomas lives in a place called Solva, a good home for an adventurer and what's more here's just solved *El Diablos*. Having breathed a sigh of relief for that, he's attacked into *Maze of Stars*, where he asks what to do when confronted by the Kommandant, how to get a pass to get past the luger-toting guard, and how to open the toolbox. The second is solved by the first, which requires a simple **MANHOTCD**.

GYNTUW MEHR UEH YAS. Can anyone help on the toolbox? Write to Raymond at 40 Bea Dene, Solna, Haverfordwest, Dyfed SA62 0TZ.

Dave Lind of Hereport wants to know how to get into the castle in *Castle Adventure* — not that this has stopped him playing the game as he's failed with that program so he can begin the adventure inside the castle, but he wants to do it legitimately. As far as I remember David, that's a simple matter of getting the right command, either GO DOOR or GO CASTLE, but if that doesn't work contact Mark 'Freak' Brocklehurst from two paragraphs ago.

Help needed on *Circus, Army of Death II, Red Little Indians* and *Perseus and Andromeda* for Neil Higgins, 6 Monmouth Court, Hendredon, Caenby, Mid Glamorgan CF8 2TG, and help offered in return on *Jackboar Time Machine* and *Juxtaposition*. And with Neil's letter I've just noticed something that could be incredibly significant. These last three letters are the only ones this month without stamped addressed envelopes enclosed, which is why they're dealt with in the column rather than with personal replies. The significance? All three of them come from Wales! So it's not true what they say about the Scots being tightfisted, it's the Welsh all along! Kindly address letters of complaint to the Race Relations Board.)

Closed Gates

Colin le Cornu is also from Wales, so those releases must really be ringing with the sound of keyboard bashing and frustrated adventurers. Colin's stuck in *Adventure Adventure*, being unable to open the Golden Gate, so keys or clues please to 153 Bowesaze, Greenmeadow, Cambrian, Gwent NP44 4LG. He should contact A.D. Gove of 43 The Downs, Harlow, Essex CM20 3RL, who's solved *Adventure* as well as *El Diablos* and *Franklin's Tomb*. He (or she) is consequently baffled on *Lost in Space* and *Fishy Business*, but so am I. I mean, wouldn't you just know it, someone writes in to ask about adventures I can actually answer problems on, and they forget to tell me what the problems are!

Paul Cooper asks how to get back once transported on *Syzygy*, and how to enter the command to get down the dark pit on the upper floor. He's been

told to hold the blanket and the string, but HOLD STRING, HOLD BLANKET and HOLD BLANKET AND STRING don't work. So what's up? Paul is perplexed at 102 Packhorse Head, Melbourne, Derbyshire DE7 9ZC.

Anyone perplexed by Dragon Moon him should contact Steve Direct: 90 Valley View, Lemington, Newcastle Upon Tyne NE10 8PA. Mr Steve has solved that one, but needs help on The Axi Trilogy and Juxtaposition. See next month's column for clues, galore. Steve.

There's been a lack of help so far this time, but let me finish with some more riddling Madness and the Minotaur from Steve Bennit, who provided some details about the spells that I gave in an earlier column. Steve says he's happy to try to answer specific questions on the adventure. If anyone wants to ring him on 0227-969671, and he'll speak most evenings from about eight to ten o'clock. The following details on Madness aren't going to be printed backwards, there are too many of them for that, but as so many people are stuck all over the place in this one I hope no-one will mind.

1st Floor: all areas dropped in the minotaur room will automatically disappear, but dropped elsewhere they may be relocated by the sprite. There is always one spell room on the floor, to which you must take the mushroom and the food. To discover the items needed to get the spellbook, LOOK POOL. The

jewel box, tablet, scabbard and scroll are Pseudo-treasures as they are found in the same locations as normal treasures but they don't score points, though some do have other uses. You can refill bottle with water from anywhere on this floor, and drinking water adds 32 points to your condition. Eating food adds 50 points, and as you eat more food is recalculated on floors one and two only.

Second Floor: at the start of each game this contains the air, fire and skull, and also has three rooms to get these spells if you need the parchment, talisman and rope from the fourth floor.

Third Floor: this always has the air, smoke, basket, mushroom and pen-

dent, and is the most difficult level to map, being split into five different areas. Use the BACK command frequently as there are many unnecessary movements possible.

4th Floor: always contains at start of each game the parchment, talisman, rope, sceptre, goblet, gloving rocks, music room and a second pit. In the music room you'll need the flute, rope and parchment (play the flute and climb the ledge). For the gloving rocks use OXEN. The LOOK PIT command works at random times, so keep trying.

I also tend to work at random times, but with any luck the next time will be next month.

Adventure Contact

To help you out adventuring further, we are instituting an Adventure Hotline — simply fill in the coupon below, stating the name of the adventure, your problem and your name and address, and send it to Dragon User Adventure Hotline, 1230 Little Paxton Street, Luton LU3 1PH. As soon as enough entries have arrived, we will start printing them in the magazine.

Don't worry — you'll still have Adventure Trail to write to as well!

Adventure:

Problems:

Name: _____

Address: _____

Adventure Contact

Adventure: Ring of War (2)

Problems: How to get past the guard? 2) Where to find the huge Ugly Alien? 3) Where to get the car? Name: Alan Astalan Scarecrow Address: 10 Lynton Road, Hatch End, Middlesex HA4 4PH Tel: 01-426 1719.

Adventure: Fungus Tomb

Problems: I am stuck and I cannot find the vine cellar or get out of the pit. Name: Jonathan Miller Address: 130 North Dixie Road, Sculpey, Kent DA14 5RJ.

Adventure: Spryng Problems Fighting radar and using the transporter. Name: A. Stonehouse and J. Stenton Address: 30 Canongate Park Road, Coventry CV4 3BW.

Adventure: Juxtaposition Problem: How do I get the sword and the Reed of Mown and the treasure box? Name: Gary Coating Address: 219 Newgate Lane, Great Budworth, Cheshire, EC10.

Adventure: Spryng Problem: What do you do when you get to the computer? How do you get to the planet and back up? Where is the light source, how

do I get the co-ordinates right? Name: Tim Address: 43 Falmouth Road, Robeydale, Shiffield SE7 2DQ.

Adventure: Williamsburg

Adventures 3 Problems: How do you get out the wall to the secret passage without being shot by the police? Name: D.H. Mason Address: 16 Portobello Road, Finsbury, Greater Manchester M9 5GD.

Adventure: Juxtaposition

Problem: How do I survive in the volcanic cave in the yellow sector? Where are the yellow and brown ID cards? Name: Fraser J. Chastain Address: 47 West Close, Kenaston, Reds M40 9RU.

Adventure: Ring of Darkness

and Madness and The Minotaur Problem: Need any help I can get, I keep getting killed. Name: Andrew Miller Address: 5 Lantau Close, Birmingham, Cleveland TS20 8HU.

Adventure: El Capitan

Problems: Everything I can offer help with. See Quest and Keys of the Wizard. Name: Christine Garcia-Mendoza Address: Callehesa No. 145, 28024 Madrid, Spain.

Adventure: The Emperor Must Die! Problem: What is the code name at the end of the action game? Name: Edward Brown Address: The Drive, Banwell, Leicestershire LE12 8LA.

Adventure: Sea Captain Pro

Mem: How many levels in Cheeky Egg? How many treasures in Caribbean in the Jungle, how to get POKE in DU. Much fun! To work for Caribbean in Space? Name: Paul Palmer Address: 10 Underhill Road, Macclesfield SK10 4HA.

Adventure: Juxtaposition

Problem: How to M the parallel inner tube (and could someone send a map)? Name: Alan Stevenson Address: 30 Cannon Park Road, Cannon Park, Croydon CR4 1WF.

Adventure: Spryng —

Mountain of Doom Problem: Everything, can't get very far, please help. Name: Neil Kestell Address: Problem: Garsmeund, Truro, Cornwall.

Adventure: Madness and The

Minotaur Problem: Could I have the halo sheet please? Name: South Fleet, Hants GU13 4GB.

Adventure: Juxtaposition

Name: Nicholas Price

Address: 47 Rading Road Problem: How do I get the white key card from the old caravan? Where is the mask? Name: Stuart Hobson Address: Skiptongate Nr 39, 8820 Mysenpoole, Norway.

Adventure: Juxtaposition

Problem: How to get the lid off the pedestal without getting passed? Name: Dominic Lacey Address: 27 Fishers Lane, Penby, Wimborne, Dorset DT1 1HF.

Adventure: The KET Trilogy —

Temple of Vor Problem: What to do with the alien that is guarding the last? How to get over the lead river? Name: David Hadfield Address: 25 Weston Avenue, Prenton, Stockport, Cheshire, SK6 0HA.

Adventure: Trekboat

Problems: How do you get onto the planet? Is there oxygen needed to stay alive on the planet? How do you get off the planet and everything after? Name: Ryan Henderson Address: 2 East Clapgate Field, Edinburgh, Scotland EH11 6TU.

Prime Examples

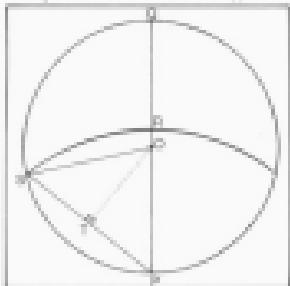
Gordon Lee sends a Dragon to catch a wild goose or two.

LAST MONTH on this page, we printed a number of short puzzles which might amuse the reader. The solution to question 1 was given last month. Here are the solutions to numbers 2, 3, and 4.

2. For this problem we were required to rearrange the nine digits (1 to 9) to form the lowest possible, and highest possible, primes. Now, a prime number is one which does not have any whole-number factors apart from itself and one. Unfortunately, there is no easy way of determining if a given number is prime or not, apart from trial division. Theoretically, if a given number is divided by all primes smaller than, or equal to, the square root of that number, and an exact division is not found, then that number is prime. Consequently, the testing of nine-digit numbers is still quite a lengthy procedure. Coupled to this is the fact that the nine digits can be arranged in over a third of a million different ways, and the task seems quite formidable.

However, at the beginning of last month's article was a word of caution to the effect that not too much reliance should be placed on using a computer method of solution. A simple mathematical rule states that if the sum of the digits of a number is divisible by 3, then that number is also divisible by 3. Now, the digital sum of the digits 1 to 9 is 45, and, as 45 is divisible by 3, any arrangement of the same digits in any order will always give a number which itself is divisible by 3. Consequently, that number cannot be prime. My apologies to any readers whose "Dragons" are still looking over on that one, looking for an answer which does not exist!

3. By contrast, this problem is an excellent example in which the computer is an invaluable tool in its solution. Indeed, there is no way of solving it by conventional mathematics except by "trial and error". This is the method that the computer uses, but the computer's ability to perform rapid and repetitive calculations makes it a task ideally suited to this method of approach.



The diagram shows the field, with centre O. It has been bisected by the diameter PC. For convenience, only half of the field will

be considered, and the ratio of the field will be taken as unity. In the diagram:

$$OC = OP = 1 \text{ (the radius of the field)}$$

Fix the point of attachment of the rope to the fence, and PR = PS (the length of the rope).

In the semi-circle, the area reached by the goat is that bounded by the radii OC and PS, and the arc PR. This is equal to the area of the sector of the circle centre O and radii OS and OP; plus the area of the sector of the circle centre P and radii PR and PS, minus the area common to both — that is the triangle OSP. With a correct value for L, this should equal one quarter of the area of the field. In the listing given, the length is initially set at a value of 1.5, and this value is consistently amended depending on the result of the calculation. Unfortunately, the mathematics used in this listing are complicated because of having to convert all angular measures to radians, and, because of the lack of an inverse cosine command on the Dragon, we need to use a circuitous method of calculation using the arctangent command.

```
10 PI=3.1415926  
20 L=1.5  
30 D=L*PI*(PI/6-ATN(L*PI/2))  
40 D=D-(ATN(PI/2)-L*PI)  
50 D=D/L*3  
60 T=(DPI*(PI/2)-1)+(S-1)*  
    (S-L)  
70 A=D-T  
80 PRINT A, PI*D  
90 IF A>55.5-(PI/4)=1E-5 THEN  
    100  
100 L=(L*4)*(PI/4)  
110 GOTO 30  
120 PRINT "THE LENGTH OF ROPE"  
130 PRINT "IS",100*L," FEET"
```

This gives a final value of 115.87586 feet.

Prizes

We're disputing title from our usual position this month by offering up eight vouchers instead of a name: prize. Gordon Lee's microsystem, and you could win one of 20 vouchers giving you £3 off any program in John Penn-Davies Software's current stock. JPSO's range includes a wide selection of disk utilities as well as old and new games, so the choice is yours.

Rules

When you have solved (you believe!) the puzzle on the page above send us a printout of your program (in cassette), and any explanation you want to include on how you arrived at your conclusion. Please mark the envelope **SEPTEMBER COMPETITION**, and don't forget your name and address.

To give us a lifeline, complete the following (Cassette Boxed upon the ground). Using your own code:

Readers who are interested will, no doubt, be able to recognise the various geometrical formulae used in this program. A more detailed account of this iterative method of solution can be found in the March '86 issue.

4. The solution to this problem, like that of problem 2, is one for which your computer will search in vain! For any square (n), such that $n \neq 1$, the following equation also applies:

$$(n-1)^2 = (n-1)(n+1)$$

Thus, one less than a perfect square is always non-prime (except when $n=2$ and so $n-1$ becomes 1). To demonstrate this graphically, lay out 16 coins in a 4 by 4 arrangement. Now remove the bottom right-hand coin. Note how the remaining three coins on the bottom row can now be placed to complete a 3 by 3 arrangement. This general principle will apply to any square, however large.

Now for this month's competition. Consider the following series of words: starting, staring, staring, string, string, sing and sin. Each word is formed from the preceding word by simply deleting a single letter at each step. This month, you have to find a similar series, but using numbers instead of letters:

-----	(a perfect cube)
-----	(a prime number)
-----	(a multiple of 7)
-----	(a prime number)
-----	(a prime square)
-----	(a prime number)

Note that you are not allowed to have leading zeros in any step, i.e., for instance, the cubic 30000000 could not be converted to the prime 800001. How many solutions can you find?

June winners

The winners of Sintefan Computing's Carlton Bennett are Colin Metherell of Northampton, John Rakes of Redditch, C. Hetherington of Bexleyheath, P.J. Taylor of Addicks, D. Morris of Plumstead, W. French of Greenwich, Chris Morley of Gosport, Paul McLean of Gloucester, Chris Jolly of Grove Park, Hank Bender of Haslemere, Nigel Davies of Cheltenham, M. Gostick of Bangor, P.A. Johnson of Stockton-on-Tees, Ray Nichols of Worcs, Keith Gould of County, S.M. Greenwell of Ingoldmells, Peter Nielsen of Sale, R. Cleaver of Threlk, and P. Elcock of Garsington, Oxfordshire, who takes us to task for finding his last entry too subtle. No problems this time: "Bathrooms can be dangerous because... (Yawn, yawn)... (Roar)... R.I.P. HOOOOoo... (sob)."

Solution

A great many people calculated correctly that the number which only repeats after four operations is 2856.

